

# Oklahoma Mesonet/ARS Quality Assurance Report February 2023

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- Mesonet technicians completed scheduled rotations of 13 batteries (BATV/BVAS), 1 aspirator fan (FANS), 2 dataloggers (LOGG), 1 barometer (PRES), 7 rain gauges (RAIN/TIP2), 8 relative humidity sensors (RELH/TSLO), 5 pyranometers (SRAD), 5 PRT thermometers (TAIR/TA9M), 2 wind directions (WDIR), 2 wind sentries (WS2M), 2 wind monitor nose cones (WSPD), 4 current excitation modules, and 2 CDMs.
- The primary battery voltage at GUTH has reported lower than neighbors since the battery was replaced in December for similar power problems. On the morning of 2023-03-09, the battery quickly fell below operating voltage, resulting in a 16 hour period of entirely missing observations. The battery was replaced once again, resuming the recording of observations. The site is functioning as expected at the time of this report.
- The datalogger at our Altus site skipped a record on 02/20 and reported multiple power losses in a short period. Power leads were found damaged. Leads were re-stripped and power supply to logger rewired. No issues since tech visit.

## Mesonet QA Report for Standard Variables

Variable	Status	Site	Ticket	Remarks
TAIR				
RELH	Resolved	EUFA	47198	Relative humidity reports -99999 and TSLO reports -7999. Power cycling sensor did not resolve problem. Cable pulled out of connection and separated. Cattle hoof marks inside site fencing but all panels were in place and tied tightly upon arrival. Land owner might have closed or they may be from a previous entrance. Data looks good after cable replacement.

<b>WSPD</b>	<b>Resolved</b>	<b>ELKC</b>	<b>47148</b>	<b>Suspect 10m anemometer may be presenting a high bias. Check if WSPD nut is loose. If not, investigate other potential problem with sensor. If loose and WSPD nut is plastic, replace with a rubber one. If already rubber, ensure nut is tightly fastened. Locking grooves on propeller were broken and propeller was loose. Rotated sensor and installed new propeller. Old sensor N144482.</b>
<b>WDIR</b>				
<b>PRES</b>				
<b>SRAD</b>				
<b>RAIN</b>	<b>Current</b>	<b>WAL2</b>	<b>47207</b>	<b>Primary rain gauge records tips at much slower rate than secondary rain gauge, but total accumulation is similar to secondary rain gauge.</b>
<b>TA9M</b>				
<b>WS2M</b>	<b>Resolved</b>	<b>BOIS</b>	<b>47160</b>	<b>2m wind often reports significantly less than WSPD, even when 10m wind reports up to 10 mph. Suspect starting threshold problem along with recurring low bias. Replace wind sentry. Replaced sensor. Connections in logger were secure prior to removal. Bearing is noisy.</b>
<b>TB10</b>				
<b>TS05</b>				
<b>TS10</b>				

<b>TS25</b>				
<b>TS60</b>				
<b>TR05</b>	<b>Resolved</b>	<b>HINT</b>	<b>47185</b>	<b>Soil moisture does not fully saturate during moist soil conditions. Unable to adjust coefficients to fit both current and historical values. Please replace sensor if no other problems found. Connections in CDM were tight. Sensor ohms 28.6 Red- Blue and 33.2 Green to Black (Normal) Cause unknown, Replaced sensor.</b>
	<b>Current</b>	<b>BLAC</b>	<b>47187</b>	<b>5cm soil moisture no longer properly saturates during moist soil conditions. Sensor has drifted over past few years and no longer reaches 0.9 FWI.</b>
	<b>Current</b>	<b>BYAR</b>	<b>47184</b>	<b>5cm soil moisture does not properly saturate during moist soil conditions. Current excitation replacement did not change behavior. Please replace sensor if no other problem found.</b>
<b>TRB10</b>	<b>Current</b>	<b>TALI</b>	<b>46584</b>	<b>10cm bare soil moisture sometimes does not properly heat, causing soil moisture to exceed allowed wet range. Prior tech visit revealed that moving soil moisture to different CE port did not change output. Tech noted bad conduit for sensor. Please replace both sensor and conduit.</b>
<b>TRS10</b>	<b>Current</b>	<b>BREC</b>	<b>47189</b>	<b>10cm sod soil moisture final temperature same as starting temperature.</b>
<b>TR25</b>	<b>Resolved</b>	<b>WEAT</b>	<b>47161</b>	<b>25cm soil sensor reports -7999 for starting, final, and average temperature. Replaced with new sensor. Unable to retrieve old sensor head.</b>
	<b>Current</b>	<b>GRA2</b>	<b>47204</b>	<b>Soil moisture reports saturation values around 1.04. Sensor cannot be recalibrated. Please replace.</b>

	<b>Current</b>	<b>WIST</b>	<b>47206</b>	<b>Soil moisture values report saturation values as high as 1.08. Sensor cannot be recalibrated. Please replace.</b>
<b>TR60</b>				

## ARS QA Report for Standard Variables

Variable	Status	Site	Ticket	Remarks
<b>RAIN</b>				
<b>VW05</b>				
<b>VW25</b>				
<b>VW45</b>				
<b>V05T</b>				
<b>V25T</b>				
<b>V45T</b>				

## FCARS QA Report for Standard Variables

Variable	Status	Site	Ticket	Remarks
<b>RAIN</b>	<b>Resolved</b>	<b>F104</b>	<b>47146</b>	<b>Gauge significantly under-reports during recent rain and snowmelt events. Found sand and other debris in top screens of rain gauge as well as inner funnel. Cleaned top funnel, inner funnel, screens, and tip buckets. Levelled sensor.</b>
<b>VW05</b>				
<b>VW25</b>				
<b>VW45</b>				
<b>V05T</b>				
<b>V25T</b>				
<b>V45T</b>				

'Current' tickets are the unresolved tickets as of the last day of the month OR those tickets added based on the Monthly QA analysis.

'Resolved' tickets are the sensor problems that were fixed during the entire month.

<b>Variable</b>	<b>Description</b>
<b>TAIR</b>	<b>Air temperature at 1.5 meters</b>
<b>RELH</b>	<b>Relative humidity at 1.5 meters</b>
<b>WDIR</b>	<b>Wind direction at 10 meters</b>
<b>WSPD</b>	<b>Wind speed at 10 meters</b>
<b>PRES</b>	<b>Air pressure</b>
<b>SRAD</b>	<b>Incident solar radiation</b>
<b>RAIN</b>	<b>Rainfall</b>
<b>TA9M</b>	<b>Air temperature at 9 meters</b>
<b>WS2M</b>	<b>Wind speed at 2 meters</b>
<b>TB10</b>	<b>Soil temperature at 10 cm under bare soil</b>
<b>TS05</b>	<b>Soil temperature at 5 cm under native sod</b>
<b>TS10</b>	<b>Soil temperature at 10 cm under native sod</b>
<b>TS25</b>	<b>Soil temperature at 25 cm under native sod</b>
<b>TS60</b>	<b>Soil temperature at 60 cm under native sod</b>
<b>TR05</b>	<b>Soil moisture: Calibrated DeltaT at 5 cm under native sod</b>
<b>TRB10</b>	<b>Soil moisture: Calibrated DeltaT at 10 cm under bare soil</b>
<b>TRS10</b>	<b>Soil moisture: Calibrated DeltaT at 10 cm under native sod</b>
<b>TR25</b>	<b>Soil moisture: Calibrated DeltaT at 25 cm under native sod</b>
<b>TR60</b>	<b>Soil moisture: Calibrated DeltaT at 60 cm under native sod</b>
<b>VW05</b>	<b>Soil moisture: Volumetric water content at 5 cm under native sod</b>
<b>VW25</b>	<b>Soil moisture: Volumetric water content at 25 cm under native sod</b>
<b>VW45</b>	<b>Soil moisture: Volumetric water content at 45 cm under native sod</b>
<b>V05T</b>	<b>Soil temperature at 5 cm under native sod</b>
<b>V25T</b>	<b>Soil temperature at 25 cm under native sod</b>
<b>V45T</b>	<b>Soil temperature at 45 cm under native sod</b>